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MONTHLY PROGRESS REPORT #6

on the

TERRAIN AVOIDANCE RADAR SYSTEM

For the period from

31 October to 30 NOVEMBER 1957

G.O. AAD-30465

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Antenna

The high speed rotary joint was redesigned to eliminate radial play. Drawings of the rotary joint housing have been released to the Model Shop.

Considerable work had already been done on a 1° antenna when it was decided to change to a 2° antenna. In order to have an antenna for laboratory use as soon as possible it was decided to complete the 1° antenna. Two designs for the rotating feed have been released to the Model Shop. A third design is now in progress. Models must be built to experimentally determine the best compromise between performance and ease of manufacture.

A design for modification of the existing parallel plate horn to incorporate a curved backwall has been completed and released to the Model Shop. The curved backwall is a method of beamshaping and may be incorporated in the antenna to simplify the scanning system. An alternate design using beamshaping in the E plane has been completed and released to the Model Shop.

Sketches of the 1° scanning head are 90% complete and Model Shop work is 40% complete. The 2° scanning head layout is 90% completed by Drafting.

Receiver-Transmitter

The layout of the R-T unit is about 50% completed by Drafting. A breadboard R-T has been assembled and is being tested.

Modulator

A breadboard modulator using the transformers designed for the system has been built and is being tested. Model Shop construction of the final unit is in progress.

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Model Shop construction is 50% complete.

Receiver

Model Shop construction of the Pre-Amp. and Post-Amp. is 50% complete.

Control Panel

The layout of this unit has been completed by Drafting. Detail drawings are now being made.

Synchronizer

Drafting has completed the schematic and main chassis layout. Layout of subunits continues.

E - Scope

Vertical and horizontal subchassis have been released to Model Shop. Main chassis drawings have been completed but not checked.

Power Supply

The chassis layout is approximately 30% complete. The voltage control boxes have been laid out and a Model built in the lab for stability tests. Drawings for control box covers have been made and submitted to electrofilm for their final proposal on temperature control.

X- Scope

The completed breadboard has undergone laboratory evaluation in this period. Most of the interference observed in the display has been attributed to poorly regulated laboratory supplies. The RCA representative gave some assistance in the proper operation of the storage tube and revised some of the initial tube data. The erase gun characteristics will continue to be under consideration.

The experimental optical system has been used with the indicator. Preliminary evaluation indicates that the system will be adequate. Effort is being

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directed to increasing light intensity of the screen. Details of the final optical system are presently being worked on.

The drafting phase of the X-Scope unit is well under way. Some detail work has started.

System Performance Test

An investigation of various possible ways of making an in-flight system performance check was made.

It was decided that the most feasible method was that of using an ultrasonic quartz delay line in shunt between the preamplifier and postamplifier. A pulse sample from the maggy is converted to a 45 mc pulse, by the receiver, and hits the delay line and it rings with a decay rate of approximately 2 db per echo. The echoes then disappear into the noise and by counting the number of visible echoes a relative measure of system performance is achieved.

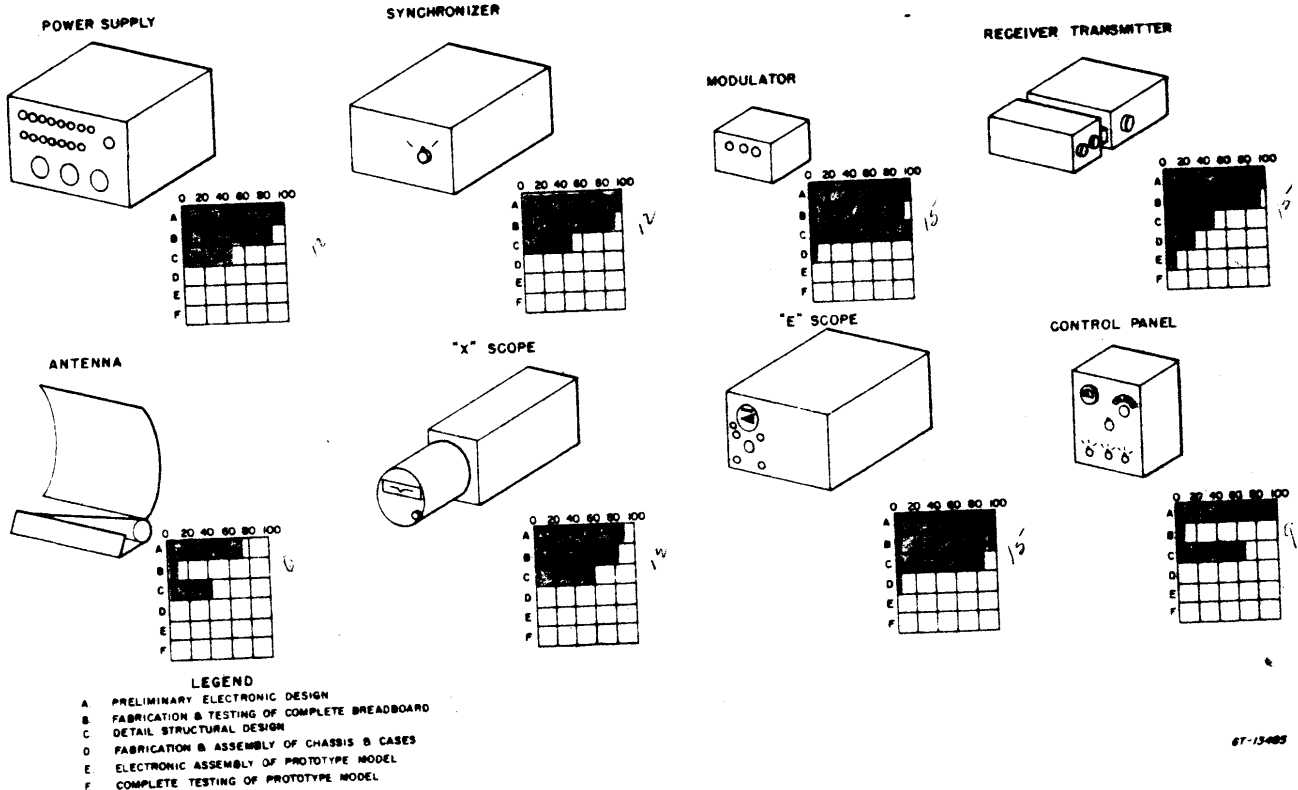
Two experimental delay line models were ordered and received from Ultrasonics, Inc.

A test set-up utilizing a pulsed klystron, in lieu of the maggy, was constructed and the operation verified. Approximately 18 to 20 echoes are visible, however, an accurate measure of system performance is not possible because of the inaccuracy of counting the number of echoes as they disappear in the noise.

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STATUS OF TERRAIN AVOIDANCE RADAR NOV 20, 1957



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